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From barrier to bridge

Digital decision support to overcome language barriers and enhance communication outcomes with migrant patients

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General introduction

General Introduction

This dissertation is about exploring how person-centred care can be delivered to migrant patients with limited proficiency in a country's dominant language(s). Specifically, we study how effective medical communication can be improved by enhancing healthcare providers' and migrant patients' shared decision-making about the selection of communication strategies to mitigate language barriers through the development of eHealth interventions, such as digital decision aids. Traditionally, shared decision-making involves a process where healthcare providers and patients collaboratively make health-related choices, considering treatment options and patients' priorities (Elwyn et al., 2017). However, there is an ongoing shift in healthcare philosophy, moving from a focus solely on patients' illnesses to a broader focus on the person behind the patient. This approach, known as person-centred care, places shared decision-making as a core principle, where patients' individual characteristics and (non-medical) needs, such as proficiency in a country's dominant languages, are considered (Ahmed et al., 2022; Ekman et al., 2021). Despite its importance, the practical implementation of shared decision-making regarding patients' language-support needs, specifically, the communication strategies needed to reduce language barriers, in clinical settings remains inconsistent, mainly due to the lack of systematic integration into routine practice (Muscat et al., 2021). Developing eHealth interventions, such as digital decision aids, offers a potential solution to enhance shared decision-making by providing healthcare providers and patients with a structured method to incorporate broader patient preferences beyond just medical. In this dissertation, we specifically address the language-support needs of patients in relation to selecting communication strategies that overcome language barriers. Incorporating such a decision aid in language-discordant consultations (i.e., consultations where the healthcare provider and patient do not share a common language) can help ensure effective medical communication and support the delivery of person-centred care for the migrant patient population. To this end, this dissertation aims to describe the development and evaluation of a digital decision aid that supports shared decision-making regarding strategies to overcome language barriers between healthcare providers and patients. This chapter will first outline the rising trends in migration and superdiversity, both globally and in the Netherlands. Next, it will describe the challenges faced in healthcare, including the increase in language-discordant consultations and their impact on patient outcomes and healthcare systems. Following this, solutions for achieving effective medical communication and shared decision-making, with a focus on person-centred care, as well as the World Health Organisation's prioritisation of eHealth interventions, will

be discussed. The introduction will conclude with the overall aim of this dissertation, research questions, and an outline of the dissertation.

Increasing Migration and Superdiversity

As of 2024, the International Organisation for Migration reported that the global migration population has exceeded 304 million (United Nations, 2025). This figure is double that of 1990, when an estimated 154 million international migrants were recorded worldwide. International migrants are defined as any person who has changed their country of residence, regardless of their legal status or the motive for their movement (United Nations, 2025). While some international migrants have moved voluntarily in pursuit of better economic opportunities and living standards, others may be forcibly displaced due to conflicts and climate change (Stankovic et al., 2021). Europe and Asia are the primary migration regions, with both accounting for approximately 31% of the migration population, followed by North America (20.9%) (Barrio-Ruiz et al., 2024; World Migration Report 2022, 2022). In Europe, family reunification is a primary reason for migration, accounting for a third (33.7%) of residence permits issued in the European Union (Eurostat, 2024). Among all ethnic minority groups, Moroccan citizens held the highest number of permits in the European Union, at 2.1 million, followed by Turkish nationals, with 2.0 million permits issued.

Indeed, Statistics Netherlands (2025) confirms that the Netherlands was a key destination for migration between 2022 and 2023, with the population increasing by 103,000 solely due to immigration. However, this growth is not surprising, as the country has had a long history of significant migration movements (Maas, 2013). While such movements date back to the Golden Age in the 17th century, this dissertation will briefly summarise the movements that began in the mid-20th century. Between the 1960s and 1970s, there was a wave of labour migration from Turkey, Morocco, and Southern Europe (e.g., Italy, Greece, and Spain) (Akgündüz, 1993; Van Mol & De Valk, 2016). Since the 1990s, there has been a flow of migrants from former Yugoslavia, Somalia, Syria, and Eritrea due to the arrival of asylum and refugee seekers, as well as from Poland, Romania, and Bulgaria, resulting from the European Union's enlargement in the 2000s (Engbersen, 2018; Van Stiphout-Kramer et al., 2024). Over the past decade, there has been a rise in education- and work-related migration from countries such as Germany, Romania, and China (Statistics Netherlands, 2023; Odé et al., 2024). Additionally, migrants have come from Ukraine because of the Russian invasion (Guild & Groenendijk, 2023). As a result, 26% of the Dutch population has a migration background, with 16% born outside of the Netherlands, and the remaining

10% being children of immigrants (Statistics Netherlands, 2023). Interestingly, despite the multi-layered migration movements, Turkey remains a significant country of origin for those migrating to the Netherlands, as people of Turkish background make up approximately 2.4% of the total Dutch population, making them the largest ethnic minority group in the country (Migration Policy Institute, 2024). This is due to the large Turkish communities already established and ongoing migration from Turkey and its diaspora, mainly for family reunification reasons (Wal et al., 2008). Such multi-layered migration has created intersections of factors, such as migration histories, education levels, and languages, contributing to superdiversity (Vertovec, 2007). While non-urban areas in the country are increasingly superdiverse, urban areas, such as Amsterdam and Rotterdam, *have* become superdiverse environments (Custers & Willems, 2024; Jennissen et al., 2023). For example, over 180 nationalities are represented in Amsterdam, and Rotterdam has no single ethnic majority, making it a “majority-minority” city (Scholten et al., 2019). These features contribute to a vast linguistic landscape, reflecting a high degree of hybridity and pluralism. Although superdiversity enriches society culturally, fosters economic dynamism, and increases global connectivity, it also presents complex challenges. These are particularly pronounced in healthcare systems, where multilingualism can create significant language barriers, leading to health inequalities (Phillimore et al., 2019). Despite this, superdiversity has been understudied in healthcare, highlighting the need to recognise it among healthcare providers and healthcare users (i.e., patients) (Meissner & Vertovec, 2016; Phillimore, 2011). Given that the Netherlands is expected to become even more superdiverse in the future, this dissertation will focus on a heterogeneous sample of migrants in part of its studies.

Language Discordance in Healthcare

Language, by itself, is defined as “the principal method of human connection, consisting of words used in a structured and conventional way conveyed by speech, writing, or gesture” (Oxford English Dictionary, 2025). However, language in healthcare is more than just a communication tool; it enables the exchange of both medical and emotional information between patients and healthcare providers, thereby fostering social interaction during their encounters (Cox & Li, 2020; Hemberg & Sved, 2021). While patients use it to provide information about their symptoms, express concerns, understand their diagnoses, discuss subsequent treatment plans and share potential negative emotions, healthcare providers use it to share information about patients’ illnesses, give instructions for treatment, and respond to (negative) emotions (De Haes & Bensing, 2009; Street et al., 2009). In language-concordant consultations, that is, when a provider and a patient can communicate in

the same language, e.g., because they are native speakers of that language (Molina & Kasper, 2019), it is easier to proceed the information exchange naturally and smoothly, in particular if the patient is not (too highly) emotionally distressed (Jack et al., 2013). Furthermore, the provider should consider the patient's health literacy (Holden et al., 2021), avoid using medical jargon (Farmanova et al., 2018), and be capable of establishing a trusting relationship (Street et al., 2009). This shared understanding helps to safeguard positive health outcomes for patients (Adams, 2010; Maskrey & Gordon, 2017; Street et al., 2009). However, as shown above, shared understanding in language-concordant consultations can only be achieved under specific conditions. In language-discordant consultations, the linguistic barrier further complicates the communication process, causing language discordance a persistent and common challenge faced by healthcare systems (Al Shamsi et al., 2020; Organi et al., 2024; Peled, 2018).

When migrants arrive in a new host country, they not only find themselves in a country entirely unfamiliar to them but also face the potential challenge of a new spoken language. Language discordance occurs when a patient and a provider “speak different first languages, which may manifest as differences in proficiency and experience, thereby hindering the ability to communicate nuances critical for understanding” (Molina & Kasper, 2019, p. 2). Among the Dutch migrant population, approximately 10% do not speak Dutch at home (Statistics Netherlands, 2022). Compared to patients in language-concordant consultations, those in language-discordant consultations are at a notable disadvantage due to miscommunication during history-taking or when describing symptoms without interpreters (Slade & Sergent, 2025). In other words, migrant patients with limited proficiency in a host country's dominant language(s) often face poorer health outcomes caused by ineffective medical communication, such as incomplete information exchange about symptoms, which can result in medical errors and limited understanding of verbal information provided by healthcare providers, resulting in a lack of treatment adherence (Diamond et al., 2019; Hull, 2016; Jacobs & Diamond, 2017; Kahler & LeMaster, 2022). Such communication issues not only harm patients' experiences during medical encounters, such as through a lack of understanding due to the absence of professional interpreters, but also negatively affect their experiences outside the consultation (De Haes & Bensing, 2009). For example, patients may not know how to follow medication instructions and may feel negative emotions about utilising the healthcare system. In cases where such negative emotions remain unresolved, it can impair patients' long-term engagement with the healthcare system, such as non-adherence to treatment plans, missed follow-up appointments,

and, in worst-case scenarios, avoidance of the healthcare system (Pandey et al., 2021; Rasi, 2020). Over time, these behaviours can, for instance, increase patients' reliance on emergency services, thereby placing additional pressure on healthcare resources (Acquadro-Pacera et al., 2024). On the patients' level, language discordance in healthcare often negatively impacts the physical and mental health of migrant patients with limited language proficiency in a host country's dominant language(s), resulting in poorer clinical outcomes, restricted access to care, patient dissatisfaction, and ultimately health inequities (Schinkel et al., 2019). On the healthcare system level, language discordance contributes to substantial health disparities in public health and increased financial costs for healthcare systems (Chiarenza et al., 2019; Ingleby et al., 2012; Lebano et al., 2020; Peled, 2018). Therefore, this dissertation will specifically focus on the language challenges arising from superdiversity in medical communication.

Achieving Effective Medical Communication in Language-Discordant Consultations

To achieve effective medical communication, healthcare providers must meet both patients' cognitive and affective needs. While *cognitive needs* refer to patients' need to know and understand their illnesses, *affective needs* relate to patients' need to feel known and understood without feeling judged (Van Vliet & Epstein, 2014). The *Six Function Model of Medical Communication* (De Haes & Bensing, 2009) outlines six goals that guide healthcare providers in addressing these two needs in an intertwined manner. The goals are: (1) *fostering a relationship*, (2) *gathering information*, (3) *providing information*, (4) *decision-making*, (5) *enabling disease- and treatment-related behaviours*, and (6) *responding to emotions*. *Fostering a relationship* refers to the extent to which a healthcare provider can build a good rapport with the patient, and it is recognised as the starting point of an effective medical communication process. While *gathering information* refers to healthcare providers' accurate collection of medical data to pinpoint a patient's illness, *providing information* relates to healthcare providers providing medical information to the patient. *Decision-making* can be understood as both the healthcare provider and patient reaching a shared decision of what treatment is most appropriate, and *enabling disease- and treatment-related behaviours* entails how the healthcare provider guides the patient in managing their disease and adhering to treatment. Finally, *responding to emotions* refers to the healthcare provider's ability to detect potential emotional issues and provide additional support, within or outside the encounter, to the patient.

The model posits that achieving the goals above will result in positive *immediate*, *intermediate*, and *long-term endpoints* (Epstein & Street, 2007). The endpoints can be *provider-*, *patient-*, or *context-related* (De Haes & Bensing, 2009). However, to assess whether the medical communication is effective, the model emphasises that this is guided primarily by specific sets of *provider-related immediate endpoints* (i.e., observable behaviours exhibited by providers) to achieve all six medical goals. For example, if the provider displays desired behaviours within the consultation, such as using small talk to build a relationship with the patient, then that would lead to positive outcomes, for instance, the patient's increased feelings of trust towards the provider outside the consultation (i.e., *intermediate endpoints*). Another example: if the provider continuously strives for effective doctor-patient communication in all consultations, this will fulfil *long-term endpoints* (i.e., optimal patient health) (De Haes & Bensing, 2009; Kaplan et al., 1989). While the concept of *provider-related immediate endpoints* is common in medical literature, the concept *communication strategies* is more widely used in communication science. Therefore, we will use the term *communication strategies* instead of provider-related immediate endpoints throughout this dissertation.

To meet patients' cognitive needs, healthcare providers can use *instrumental communication strategies*, such as using the teach-back technique, avoiding medical jargon, and repeating oneself (Ha Dinh et al., 2016; Wittink & Oosterhaven, 2018). They can also use *affective communication strategies*, such as engaging in small talk, maintaining eye contact, and using open body language to meet patients' affective needs (Lorié et al., 2017; Ratka, 2018; Reifarth et al., 2024). Utilising these communication strategies serves as a fundamental basis for achieving the observable consequences related to patients (e.g., patients' treatment adherence) after the medical encounter and the observable implications pertaining to patients' overall health (e.g., longevity) (De Haes & Bensing, 2009). Nevertheless, in the face of language discordance, relying solely on instrumental and affective communication strategies without professional interpreters is often insufficient to meet the needs of migrant patients with limited proficiency in the host country's dominant language(s) due to the language barrier. For example, an observational analysis of language-discordant consultations showed that healthcare providers persistently attempted to ensure migrant patients' understanding of their diagnoses via constant repetition and rephrasing of medical information (Landmark et al., 2017) rather than modifying their communication strategy (e.g., requesting a professional interpreter). Even when this strategy was applied for over ten minutes, migrant patients frequently responded minimally, reflecting a limited level of understanding. Similarly, a thematic analysis

revealed that migrant patients in language-discordant consultations often face consultations where they struggle to understand medical information (Czapka et al., 2019). These unsuccessful consultations frequently result in the need for an additional appointment with an interpreter, which delays the treatment process. Indeed, Turkish-Dutch patients in the Netherlands tend to visit their general practitioners more frequently than native Dutch patients, possibly because they keep returning due to their ongoing difficulty understanding what has been discussed (Deville et al., 2006). Such research illustrates that when there is language discordance during consultations, additional challenges emerge, particularly in terms of healthcare providers' obligations to overcome language barriers before patients' cognitive and affective needs can be met (Diamond & Jacobs, 2010; Squires, 2018). If the language discordance is anticipated in advance, it can improve efficiency in overcoming such language barriers (Steinberg et al., 2016).

To overcome language barriers, healthcare providers can utilise communication strategies such as professional interpreters. On-site professional interpreters are regarded as the gold standard for addressing language barriers in healthcare (Brandl et al., 2020; Flores, 2005; Karliner et al., 2007). Because they are trained to protect patient privacy and confidentiality and to accurately convey complex information, professional interpreters outperform informal interpreters (e.g., family members acting as interpreters) and ad-hoc interpreters (e.g., bilingual clinical staff) in improving patient-reported and clinical outcomes. It is therefore no surprise that considerable efforts have been made to develop various interventions aimed at increasing the use of professional interpreters during language-discordant consultations (e.g., Krampe et al., 2022; Lopez-Bushnell, 2020). For instance, Ikram et al., (2015) developed an e-learning module that improved medical students' self-efficacy and knowledge about involving professional interpreters. Despite these interventions, the actual use of professional interpreting services in language-discordant consultations remains low (Taira et al., 2019). A small number of healthcare providers argue that they prefer not to involve professional interpreters because they either believe that a language barrier does not exist, that the medical information presented is not complex, or that patients do not want such services (Suurmond et al., 2015). The wider literature indicates that the underutilisation of professional interpreters stems from a myriad of potential barriers, including logistical, perceptual, and practical barriers (Schouten, 2017). However, the most prominent barrier depends on the context. For example, across countries, variations exist in the availability of medically trained interpreters and funding resources (MacFarlane et al., 2020). In the Netherlands, healthcare providers have been particularly affected by practical

barriers, specifically the lack of national financial support for involving (on-site) professional interpreters during consultations between 2012 and 2020 (Boe, 2015; Teunissen et al., 2017). Since 2020, however, the use of professional interpreters has increased, as financial barriers have been alleviated in several medical settings (e.g., midwifery) (see Johannes Wier Stichting, 2025). Despite this progress, healthcare providers may still encounter difficulties in accessing such resources. For example, a study conducted by Jaeger et al. (2019) revealed that 44% of Swiss healthcare providers reported a lack of knowledge about arranging professional interpreters as one of the main barriers to their use. When these barriers remain unresolved, providers often resort to adopting the getting-by approach (Diamond et al., 2009). This involves either continuing language-discordant consultations without requesting professional interpreting services, or relying on informal or ad-hoc interpreters (Roels et al., 2015; Zendedel et al., 2016).

The main advantages of informal and ad-hoc interpreters are their convenience, cost-effectiveness, and occasional support for healthcare providers in delivering culturally appropriate consultations or providing emotional support for patients when necessary (Hadziabdic et al., 2014; Van Lent et al., 2025). Despite these benefits, they also have weaknesses, such as inadequate medical interpretation, potential breaches of patient privacy and confidentiality, and in extreme cases, informal interpreters might even alter the communication due to personal agendas (Zendedel et al., 2018b). If informal interpreters are underage, this can create additional problems, such as emotional trauma for the child and parent due to shame and embarrassment or impact the child's educational progress if they must miss school to accompany their parents to a consultation (Angelelli, 2019; Flores, 2005; Sarfraz & Wacogne, 2019). Fortunately, recent technological advancements have made professional interpreting services more accessible through various modalities, including phone and video calls. Additionally, digital translation tools, such as computer-assisted translation and machine translation software, have seen significant improvements, largely thanks to advancements in artificial intelligence (DePalma & Lommel, 2025). A study (Escobedo et al., 2023) involving Chinese and Latino patients with limited English proficiency showed that these patients do not have strong preferences regarding the modality of professional interpretation. They found no statistical differences in the ratings given to the quality of interpretation across all modalities, all of which were rated as either "very good" or "excellent", indicating their overall satisfaction with all modalities. However, healthcare providers and professional interpreters generally favour on-site professional interpretation because of the operational and communication challenges associated with remote interpretation (Ruiz et al., 2025). Interpreters view

themselves as particularly valuable for establishing rapport and helping providers understand patients' social and cultural backgrounds (Price et al., 2012). Interestingly, current evidence does not conclusively link the interpretation modality to patient-reported experiences of medical communication, which suggests that various modalities may be similarly effective rather than distinctly so (Ruiz et al., 2025).

Moreover, specific digital translation tools, such as fixed phrases, have proven useful in simple communication scenarios or in emergency care (Van Lent et al., 2025). The suitability of these tools depends on various factors, including the severity of the patient's condition, the duration of the consultation, and the complexity of the source and target languages needed (Venkatesan et al., 2022). Generally, professional interpreting services across various modalities and digital translation tools now benefit from some advantages of informal and ad-hoc interpreters, such as the immediate availability of professional phone interpreters, while also reducing their limitations, such as informal interpreters' limited ability to interpret complex medical information. This technological evolution in communication strategies may lower barriers for healthcare providers when selecting the most effective strategy for patient care. Despite these advances, the utilisation of professional interpreters across modalities and digital translation tools varies significantly within and between healthcare systems (Khoong et al., 2019; Khoong & Fernandez, 2021). In the Dutch context, their inconsistent use may be due to healthcare providers adhering to the former *Dutch Quality Standard on Interpreter Use for Non-Native Speakers in Healthcare* published in 2014 (Kwaliteitsnorm Tolkgebruik Bij Anderstaligen in de Zorg, n.d.), which primarily guided decisions on involving informal or (on-site) professional interpreters. As of 2025, a new guideline entitled *The Guideline for Dealing with Language Barriers in Healthcare and the Social Domain* ('Richtlijn "Omgaan Met Taalbarrières in de Zorg En Het Sociaal Domein"', n.d.) has been introduced, explicitly recognising digital translation tools as one of the communication strategies for overcoming language barriers. Healthcare providers' limited awareness of the full range of communication strategy options and challenges in adapting communicative habits during language-discordant consultations may also contribute to their infrequent adoption (Czapka et al., 2019; Landmark et al., 2017; Schenker et al., 2008), leading them to make ad-hoc, pragmatic decisions regarding language barriers. Such decisions may violate migrant patients' right to health, though (Interpreting in Health Care, n.d.). In accordance with *Article 12 of the International Covenant on Economic, Social and Cultural Rights* (n.d.) and *Article 11 of the European Social Charter* (The Right to Protection of Health - Social Rights, n.d.), everyone in the Netherlands, regardless of their background, has the

right to the highest possible standard of physical and mental healthcare. The ongoing inconsistency in approaches to overcoming language barriers hampers effective medical communication and ultimately disrupts the delivery of person-centred care for migrant patients with limited language proficiency in their host country's dominant language(s). To ensure effective medical communication, structured conversations should be conducted to prevent healthcare providers from making one-sided decisions about how language barriers are addressed. One approach is to enhance shared decision-making on how to mitigate language barriers in language-discordant consultations. Prior to advocating for shared decision-making between healthcare providers and patients, though, it is imperative to obtain a comprehensive understanding of the various communication strategies utilised to address language barriers within the Dutch healthcare context. Consequently, this dissertation aims to first identify these communication strategies through an examination of perspectives from a heterogeneous sample of healthcare providers, migrant patients, and informal caregivers.

Effective Communication and (Non-Medical) Shared Decision-Making in Person-Centred Care

Person-centred care focuses on the values and preferences of patients, recognising the individual behind the patient (Ekman et al., 2011; Gyllensten et al., 2025). Although it is often used interchangeably with patient-centred care due to shared themes, such as personalised care, the patient-provider relationship, and effective communication, the two types of care differ in their ultimate aims (Håkansson Eklund et al., 2019). Patient-centred care primarily seeks to enable patients to live functional lives by reducing symptoms and promoting physical and mental well-being (Penedo et al., 2020). In contrast, person-centred care aims to help patients find meaning in life and live well (Ekman et al., 2021). Essentially, person-centred care broadens the focus beyond medical limitations, considering the person's overall life context. When delivering this type of care, providers take into account not only the effects of illness but also factors arising from a person's life and history, which are inseparable from their health condition (Ekman et al., 2021). In this dissertation, we therefore adopt the concept of person-centred care instead of patient-centred care because it encompasses non-medical limitations, such as limited language proficiency in the country's dominant language(s). This broader perspective promotes a more inclusive approach to healthcare (Clayman et al., 2017).

To effectively implement person-centred care, a group of clinical and non-clinical academics in Sweden established the University of Gothenburg Centre for Person-

Centred Care (Ekman et al., 2011, 2021). They aimed to outline a three-step approach for applying such care in everyday clinical practice. This approach specifies three routines that healthcare providers should follow: 1) initiate a partnership with the patient, 2) implement the partnership, and 3) safeguard the partnership. In the first routine, initiating a partnership, healthcare providers must elicit the patient's narrative, meaning they need to understand the person's perception of their illness and its impact on their life. This contrasts with medical narratives, where the provider mainly focuses on diagnosing and treating the disease. In the second routine, implementing the partnership, the provider, patient (and sometimes the patient's relatives) work together to develop a health plan with mutually agreed goals. To do this, providers must identify the patient's available resources and capabilities for self-care, such as by examining the patient's social network. In the final routine, safeguarding the partnership, the agreed health plan should be well-documented so that both the provider and the patient can access it. This can be achieved through documentation in the patient record.

Nonetheless, to ensure healthcare providers effectively implement the three proposed routines, it is essential to understand the underlying mechanisms, i.e., the factors that produce specific effects, of person-centred care (Lemire et al., 2020). According to a rapid realist review conducted by Ahmed et al. (2022), one of the key underlying mechanisms of person-centred care is *effective communication*. Similar to the *Six Function Model of Medical Communication* (De Haes & Bensing, 2009), providing effective communication in the context of person-centredness involves healthcare providers being compassionate, listening carefully to the patient's circumstances, using simple language, and checking the patient's understanding to promote clarity. Less similarly, though, is its explicit mention of deploying an interpreter when necessary (Ahmed et al., 2022). In other words, while the *Six Function Model of Medical Communication* (De Haes & Bensing, 2009) assumes that patients speak the providers' language fluently, effective communication in person-centred care recognises that not all patients can speak the providers' language fluently (Ahmed et al., 2022). Although there are other underlying mechanisms (see Ahmed et al., 2022 for the full list), effective communication is the most crucial part of the entire care encounter, serving as the primary foundation of person-centred care (Ahmed et al., 2022; Bauchat et al., 2016). In the context of language-discordant consultations, if providers and patients cannot communicate effectively by overcoming language barriers with appropriate communication strategies, the other mechanisms cannot be fulfilled. Considering the patient's specific individual non-medical characteristics, particularly their

language proficiency in the country's dominant language(s), is therefore essential. Adopting another underlying mechanism of person-centred care, namely *shared decision-making*, can be a valuable tool to help providers and patients collaborate in discussing their language proficient in the country's dominant language(s).

Traditionally, shared decision-making mainly involves a healthcare provider and a patient reviewing treatment options, the patient's values, goals, and priorities together to make joint, informed health-related decisions (Elwyn et al., 2017). However, in person-centred care, because the person is recognised behind the patient, shared decision-making extends to discussing non-medical decisions as well, such as an individual's characteristics and preferences that may indirectly affect the care process (North, 2020). Although eliciting individuals' strengths and weaknesses is deemed important, traditional medical training emphasises task completion, i.e., assessing symptoms and providing treatment plans, rather than the provision of person-centred care (Erickson et al., 2017). As a result, this has led to poor communication patterns among healthcare providers, especially during language-discordant consultations (Schenker et al., 2008). As illustrated in the earlier sections, however, language barriers are one of the most immediate contextual factors impeding effective communication. While providers have reported difficulties in evaluating their patients' preferences regarding communication strategies to overcome language barriers, patients have found it hard to reflect on how language barriers can be better mitigated (Paternotte et al., 2017). To enhance healthcare providers' communication in language-discordant consultations, it is essential to support them in adopting appropriate communication strategies. Specifically, providers should be guided to engage in shared decision-making with patients regarding language barriers. This can be achieved by establishing a systematic, routine conversation about communication strategies to overcome these barriers, thereby facilitating effective communication in these consultations (Muscat et al., 2021). Given that eHealth interventions have been found to improve patient health outcomes significantly and may promote more efficient, person-centred care (Penedo et al., 2020), developing one focused on supporting shared decision-making about the selection of communication strategies to overcome language barriers could be a promising solution.

WHO Prioritisation and eHealth Interventions

In the context of an increasingly superdiverse global population and recognising the vital role that language plays in achieving effective medical communication, the World Health Organisation (WHO) (2019) has advocated for the development of

eHealth interventions to safeguard the healthcare rights of migrant patients with limited language proficiency. The WHO defines eHealth as the cost-effective and secure use of digital technologies to support health-related fields, such as improving healthcare services and education, enacting health surveillance, and enhancing healthcare delivery (World Health Organisation, n.d.). To put it more simply, eHealth interventions utilise digital technologies to achieve various health-related objectives such as facilitating self-management or promoting patient engagement (Gentili et al., 2022). Due to the rapid advancement of digital technologies, eHealth interventions have taken shape in various forms, at large, focused on individuals' health and wellness across the lifespan (Ivanitskaya et al., 2025). They can be categorised according to their delivery mode (i.e., the technology used) and the health target outcomes they aim for. For example, while telehealth platforms have been developed to allow neurosurgeons to review imaging while consulting patients (see Whetten et al., 2018), mHealth (i.e., mobile health) uses mobile services, e.g., wearables, to monitor individuals' biometrics, e.g., heart rate, to detect irregular rhythms (see Santala et al., 2022). Among the various types of eHealth interventions, most are web-based (e.g., websites and web applications) because of their widespread ability to quickly increase patients' access to health information, thereby enhancing the efficiency of health information delivery (Chaudhry et al., 2006; Shekelle et al., 2006; Srivastava et al., 2015). In fact, as of 2024, all European Union Member States provide citizens with ubiquitous online access to their health data (European Health Data Space Regulation (EHDS) - European Commission, 2025). As outlined above, shared decision-making is a complex process to implement; therefore, in the context of eHealth interventions, web-based decision aids (also known as digital decision aids or online decision support tools) are often created to enhance patient knowledge and involvement in healthcare decisions, thus further supporting shared decision-making (Hoffman et al., 2013).

Digital decision aids are tools that facilitate shared decision-making by providing evidence-based information on medical options, typically detailing the benefits and harms associated with each choice (Kunneman et al., 2016; Stacey & Trevena, 2024). Using such aids can help increase active patient participation in decision-making, thereby enhancing the quality of the shared decision-making process and increasing satisfaction with the selected option. Decision aids are available in various formats, with the two most common types being patient decision aids and conversation aids (also sometimes known as encounter decision aids) (Scalia et al., 2019). Although both types of tools are similar in the sense of information provision, they serve different purposes. Generally, patient decision aids assist patients in making informed

decisions by preparing them to engage in the shared decision-making process with healthcare providers, providing relevant information on specific medical concerns to improve their understanding (Légaré et al., 2014). They are most commonly developed to enhance shared decision-making for complex medical diagnoses, such as cancer-related decisions (Josfeld et al., 2021; McAlpine et al., 2018; Volk et al., 2020). Conversely, conversation aids aim to directly support both the patient and healthcare provider in making joint, informed decisions rather than focusing on surrogate outcomes such as patient knowledge (Stacey & Trevena, 2024). Existing literature suggests that both types of decision aids not only promote greater patient involvement in healthcare decisions but also improve communication between patients and providers (Stacey & Trevena, 2024). However, managing language barriers is a complex task that requires input from both the patient and the provider (Steinberg et al., 2016). If healthcare providers initiate a dialogue with patients about how to manage language barriers effectively, it may lead to changes in how language barriers are currently addressed in practice. Given the demonstrated success of such aids, this dissertation aims to develop a digital decision aid — a digital conversation aid — to support patients with limited language proficiency and healthcare providers in making shared decisions about communication strategies to overcome language barriers during future consultations.

Overall Aim of this Dissertation

The development of a digital decision aid for migrant patients with limited language proficiency in their host country's dominant language(s) and healthcare providers aimed at enhancing shared decision-making about the selection of communication strategies to overcome language barriers may help foster effective communication and, ultimately, the delivery of person-centred care in language-discordant consultations. However, two important knowledge gaps remain. First, effective communication strategies used to mitigate language barriers while meeting the six medical goals outlined in the *Six Function Model of Medical Communication* (De Haes & Bensing, 2009) have not been systematically identified. We aim to extend the existing model with the identified communication strategies so that it also addresses achieving effective communication in language-discordant consultations. Second, while digital decision aids have so far mainly been created to support medical decision-making, the design (e.g., content and format) of a tool aimed at improving non-medical decision-making, namely, patients' language-support needs (i.e., communication strategies for overcoming language barriers) has yet to be explored. Therefore, this dissertation intends to fill these two knowledge gaps. In Part 1 of

this dissertation, we will first gather the perspectives of a heterogeneous sample of migrant patients, healthcare providers, and their informal caregivers to identify the communication strategies that help migrant patients with limited Dutch language proficiency and healthcare providers to overcome language barriers effectively. This will provide a comprehensive overview, enabling the extension of the existing *Six Function Model of Medical Communication* with strategies explicitly tailored to language-discordant consultations, which is a necessary step for developing the digital decision aid. In Part 2 of this dissertation, we will then translate the identified communication strategies into a digital decision aid that facilitates their adoption in practice. However, for the aid to be used effectively, it is imperative to 1) adopt a user-centred design approach, which involves closely engaging end users of the tool at all stages of development (Abrams et al., 2004; Farao et al., 2020; Witteman et al., 2015), and 2) ensure it is developed in a person-centred way, meaning that the aid responds to local conditions and contexts (Merner et al., 2023; North, 2020). Hence, to fill the second knowledge gap, we will employ the *Spiral Technology Action Research Model (STAR Model)* (Skinner et al., 2006) to guide the development of our digital decision aid. As the STAR Model emphasises the involvement of *all* relevant stakeholders and not just its end users (which in our case are migrant patients and healthcare providers), members of the *Right2Health* consortium—comprising the University of Amsterdam, RadboudUMC, Catholic University of Leuven, University of Ghent, Utrecht University, and the Dutch Patients Federation—will be engaged throughout the development process.¹ This means individuals with backgrounds in linguistics, primary care, and policymaking will participate in the model's five iterative cycles: 1) *Listen*, 2) *Plan*, 3) *Do*, 4) *Study*, and 5) *Act*. In the *Listen* phase, the primary objective is to understand the needs and preferences of the target community. For us, this will involve conducting a needs assessment to explore the needs and preferences of migrant patients and healthcare providers regarding the digital decision aid. In the second phase, *Plan*, results from the *Listen* phase should be translated into clear strategies for technology development. In our case, this means that a prototype of the digital decision aid will be developed based on the results of the needs assessment. The *Do* phase consists of testing the digital decision aid through usability trials, primarily with healthcare providers such as general practitioners, as well as Turkish-Dutch patients with limited Dutch language proficiency and their caregivers. The reasons we focus on these two particular groups are that general practices have

1 See <https://www.right2health.eu/project-team> for a comprehensive overview of the *Right2Health* consortium.

a gatekeeping role in the Dutch healthcare system, and the Turkish-Dutch, as the largest ethnic minority group in the Netherlands, have the lowest Dutch language skills compared to other ethnic minority groups (Klokgieters et al., 2018; Wammes et al., 2014). Once finalised with the usability testing results, the digital decision aid will be evaluated in practice in the *Study* phase, through a randomised controlled trial in general practices with Turkish-Dutch patients with limited Dutch language proficiency to assess its effectiveness on communication and patient outcomes. Finally, if the aid proves effective, it will be further disseminated into practice during the *Act* phase.

Research Questions and Dissertation Outline

The main aim of this dissertation is to describe the systematic development and evaluation of a digital decision aid that can help healthcare providers and migrant patients with limited language proficiency to engage in shared decision-making. This aid focuses on selecting communication strategies to overcome language barriers and ensure effective medical communication. This aim will be accomplished by addressing the above-mentioned knowledge gaps through the following research questions:

RQ₁: From the perspectives of healthcare providers, what communication strategies do they report using to meet the goals of the *Six Function Model of Medical Communication* while mitigating language barriers during language-discordant consultations? (Chapter 2)

RQ₂: From the perspectives of migrant patients and informal caregivers, what communication strategies do healthcare providers use to meet the goals of the *Six Function Model of Medical Communication* while mitigating language barriers in language-discordant consultations? (Chapter 3)

RQ₃: What are the needs and preferences of healthcare providers and migrant patients, regarding the content and format of a digital decision aid aimed at supporting shared decision-making about the communication strategies to use for overcoming language barriers in language-discordant consultations? (Chapter 4)

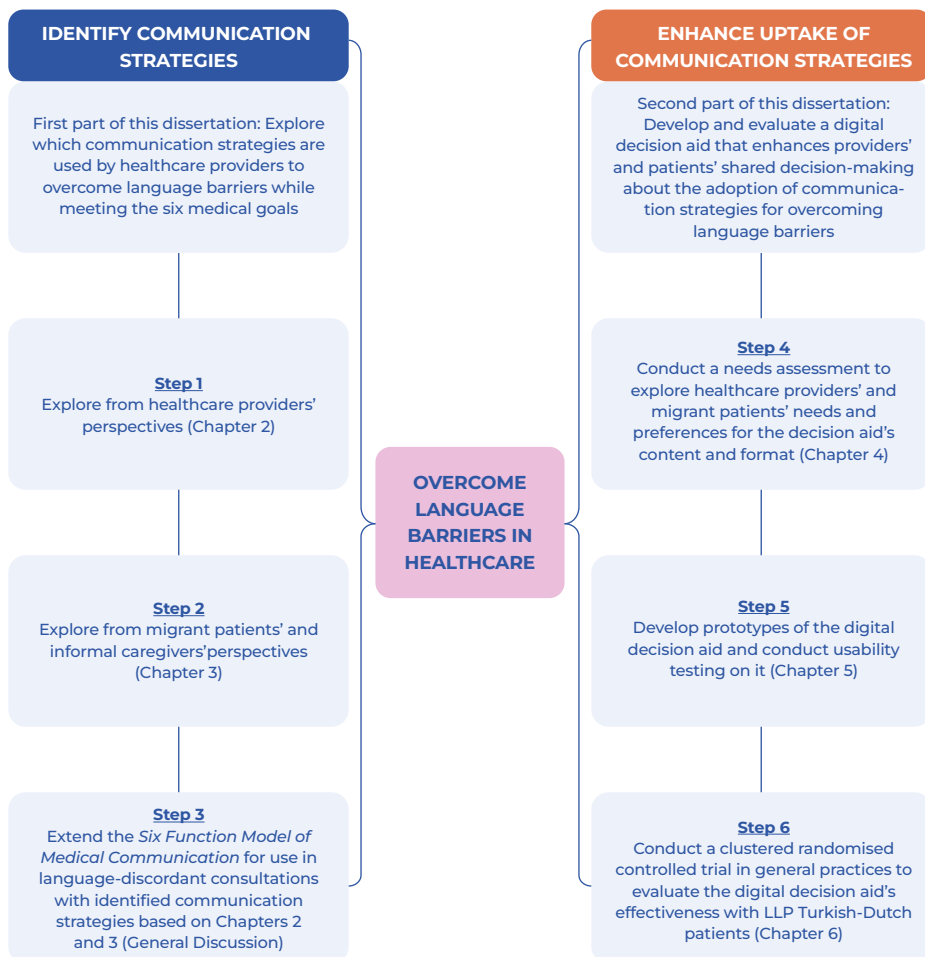
RQ₄: How do healthcare providers, migrant patients, and informal caregivers evaluate the format and content of the digital decision aid? (Chapter 5)

RQ₅: Do language-discordant consultations supported by the digital decision aid lead to better patient-reported outcomes compared to language-discordant consultations without the support of the digital decision aid? (Chapter 6)

Chapters 2 to 6 describe the studies undertaken to inform the development of the digital decision aid, MediLanguage. This includes interviews, usability testing, and a randomised controlled trial (RCT). Since each chapter was written as a separate article, there may be some overlap in the information presented in each introduction, as well as differences in how the content of each chapter is organised. While each chapter can be read independently, they do represent the different phases of the *Spiral Technology Action Research Model* (Skinner et al., 2006). In other words, the chapters build upon each other to form a narrative, spanning from the needs assessment to the evaluation of the intervention, and contributing to the main aim of this dissertation. Figure 1 provides a visual outline of this dissertation.

Figure 1

Overview of the Research Outlined in this Dissertation



- Chapter 2** As a first step to gather evidence on the communication strategies that healthcare providers report using to mitigate language barriers in language-discordant consultations, Chapter 2 describes the results of semi-structured interviews conducted with a heterogeneous sample of healthcare providers. The goal is to see what communication strategies they report using to meet the six goals under the *Six Function Model of Medical Communication* to achieve effective medical communication.
- Chapter 3** In Chapter 3, we further identify and verify the evidence gathered from Chapter 2 by conducting semi-structured interviews with a diverse sample of migrant patients with limited Dutch language proficiency and their informal caregivers. These interviews aim to cross-check the communication strategies used to overcome language barriers as reported by healthcare providers. This results in a clearer understanding of which communication strategies are employed.
- Chapter 4** After identifying effective communication strategies to overcome language barriers during discordant consultations, the next step is to incorporate them into the digital decision aid we aim to develop, ensuring proper adoption in practice. Nonetheless, it is essential to develop the aid based on empirical evidence, especially concerning the needs and preferences of healthcare providers and migrant patients. As such, in Chapter 4, we conduct a needs assessment to explore the needs of healthcare providers, migrant patients, and informal caregivers regarding the content and format of the digital decision aid. We include informal caregivers in the assessment as their experiences as informal interpreters can offer additional insights. The chapter reveals an overview of the most important features to consider during the development process.
- Chapter 5** Using the results from Chapters 2, 3, and 4, we develop the content and format of the digital decision aid. Hence, Chapter 5 describes the development and testing of the digital decision aid, which we unanimously agreed to name as 'MediLanguage'. A think-aloud method is applied in the testing of MediLanguage through several iterative rounds involving healthcare providers from general practices, Turkish-Dutch patients with limited Dutch language proficiency, Turkish-Dutch informal caregivers, as well as usability specialists. The usability testing results led to a ready-to-use version of MediLanguage in the form of a web application.

Chapter 6 The systematic development and usability testing described in the previous chapters resulted in a ready-to-use digital decision aid, MediLanguage, that needs to be evaluated in practice. Therefore, Chapter 6 details the evaluation of MediLanguage through a randomised controlled trial (RCT). The RCT enables us to assess MediLanguage's effectiveness, and we examine its impact on perceived shared decision-making about language barriers, perceived decisional conflict related to language barriers, patients' communication self-efficacy, and their satisfaction with the consultation.

Chapter 7 In the final chapter of this dissertation, we reflect on all the studies conducted in the previous chapters and attempt to answer the research questions proposed earlier in this chapter. Before ending with an overall conclusion, we consider the theoretical and methodological aspects of this dissertation, as well as discuss avenues for future research and practical implications of MediLanguage.